

Psychosocial Factors Associated With Young Elementary School Children's Intentions to Consume Legumes: A Test of the Theory of Reasoned Action

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Abstract

Objective. The purpose of this study was to test the utility of the Theory of Reasoned Action (TRA) in explaining young elementary school children's intention to consume legumes.

Methods. A survey was conducted with children in an urban, multicultural community in Massachusetts. A total of 336 children participated. Logistic regression analysis was used to assess the strength of the relationship between attitude and subjective norm and intention.

Results. Although attitude was significantly associated with intention, the pseudo- R^2 for the regression model that included only the TRA constructs was extremely low (.01). Adding demographic factors and preference improved the model's predictive ability, but attitude was no longer significant.

Conclusion. The results of this study do not provide support for the predictive utility of the TRA with young elementary school children for this behavior, when demographic factors are accounted for. Hedonic factors, rather than reasoned judgments, may help drive children's intentions. (*Am J Health Promot* 2006;21[1]:13–15.)

Key Words: Legumes, Children, Theory of Reasoned Action, Prevention Research. Manuscript format: research; Research purpose: modeling/relationship testing; Study design: nonexperimental; Outcome measure: behavioral; Setting: school; Health focus: nutrition; Strategy: behavior change; Target population age: youth; Target population circumstances: geographic location; Other: health promotion

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PURPOSE

Legumes are a healthful food choice for children. They are high in protein, complex carbohydrates, several minerals, and folate, yet low in fat and sodium. In addition to the benefits that are conferred by these nutrients, there

is growing evidence that fiber and other compounds found in legumes may help prevent a number of chronic diseases, including cardiovascular disease,¹ obesity,² and certain types of cancer.³

Despite the fact that legumes are nutrient-dense and inexpensive, chil-

dren consume very little of them.⁴ In order to attempt to increase consumption, it is important to learn more about the factors that mediate it. The Theory of Reasoned Action (TRA) and its extension, the Theory of Planned Behavior, have been shown to predict other diet-related health behaviors in children.^{5,6} However, to our knowledge, no studies have examined the use of the theory with young elementary school children. As this group is increasingly targeted for behavioral interventions in an effort to prevent chronic disease later in life, there is a need for more research to determine which theories and models of behavior change are appropriate to use with this population.

METHODS

Design

According to the TRA, behavioral intention is the proximal determinant of behavior, and is the product of attitudes toward the behavior and of subjective norms.⁷ A person's attitude toward a behavior derives from beliefs about the outcomes of performing the behavior and their evaluation of those outcomes. Subjective norms are determined by a person's normative beliefs (beliefs about whether important referents to the person approve or disapprove) and their motivation to comply with those referents. A survey that included measures of TRA constructs was conducted in fall 2003 with children in a culturally diverse community in Massachusetts. For children, preference is the main factor associated with consumption of other healthful foods.⁸

This factor was also measured and analyzed. All study protocols and methods were approved by the Institutional Review Board at Tufts University.

Sample

Children in grades one through three (mean age 7.9 years, SD .99) from eight elementary schools participated. A total of 336 children completed the survey (36.7% participation rate). Approximately half of the children were female (52.1%). The sample was 44.6% white, 22.6% Hispanic, 10.4% Asian, 8% African-American, and 14.3% multiracial or other ethnicity.

Measures

The survey was used to determine children's beliefs and intention to choose beans at school lunch. Although these children were very young, other studies have demonstrated that this is a valid method to determine psychosocial factors in this population.⁹ The survey was interviewer-administered to account for variable and limited reading skills, and a smile-frown response scale was used because this type of pictorial response format is often used with young children.⁹

The behavioral intention question was based on the types of questions used in a scale developed by Liquori et al.¹⁰ to determine intention of students in grades Kindergarten through six to consume plant foods. To be specific in terms of time and place, students were asked about intention to consume legumes next time at school lunch. The response options were "Yes," "Maybe," and "No." The "Yes" and "Maybe" responses were combined for the analyses.

According to district food service records, a legume side dish was typically served once per month. Most children were also exposed to legumes at home. On a separate survey, 54% of the children's parents responded that legumes were typically served at home at least once per week. The normative belief and motivation to comply questions referred to friends because they were likely to be the most salient referents in the school lunch setting. Subjective norm was calculated by taking the product of normative belief and motivation to comply. Behavioral belief questions were based on the most salient positive and negative factors that emerged from focus group

Table 1
Correlation Matrix for the Study Variables

Variable	1	2	3	4
1. Intention	1.00			
2. Attitude	0.118*	1.00		
3. Subjective norm	0.048	0.018	1.00	
4. Preference	0.351*	0.093	0.089	1.00

* Significant ($p < 0.05$).

data. Outcome evaluations were not measured because pilot testing indicated that children universally rated positive outcomes positively and negative outcomes negatively. Attitude toward behavior was calculated by summing the positive and negative behavioral beliefs.

A legume preference score was determined through a scale of eight questions that asked whether the child liked four different types of beans and four bean dishes that were chosen based on focus group data. Responses were "like," "so-so," "dislike," or "never had it before." Only a "like" response contributed to the preference score.

Pilot testing confirmed that the questions were clear and appropriate for the target population. The survey was administered in schools by a team of trained data collectors using a standard protocol. To determine test-retest reliability, the survey was readministered to a subset of children 1 hour later. Test-retest correlations were above .8 for the positive behavioral belief (Spearman's $r = .996$) and preference ($r = .889$). For the rest of the questions, test-retest reliability was below .7 (negative behavioral belief, $r = .657$; normative belief, $r = .614$; motivation to comply, $r = .669$; and intention, $r = .581$). Only data from the initial test was used in the regression analysis.

Analysis

Spearman correlations were calculated using SPSS (version 12.0 for Windows; SPSS Inc.). Hierarchical regression analyses were then used to evaluate the contribution of the TRA components to the prediction of intention, as well as the effects of sex, ethnicity, and preference. Logistic regressions that accounted for the clustering of students by school were performed using the

STATA program (Version 8.2 for Windows; StataCorp LP).

RESULTS

Attitude and preference were both significantly correlated with intention to choose beans at school lunch (Table 1). In the first regression model, attitude was significantly associated with intention, whereas subjective norm was not (Table 2). However, neither was significantly associated when sex and ethnicity were added in step two. Hispanic and multiracial/other ethnicities were significantly associated with intention. Preference was significantly associated with intention when added to the model in step three.

Although the pseudo- R^2 that results from the logistic regression is not directly comparable to that of ordinary least squares regression, it gives some indication about the amount of variance explained by predictors in the different models. The pseudo- R^2 for the first model, which included only the TRA constructs, was extremely low (.01). It improved to .06 when sex and ethnicity were added in step two, and improved again to .13 when preference was added in step three.

DISCUSSION

Summary

The results of this study do not provide support for the predictive utility of the TRA with young elementary school children for this behavior, when demographics are accounted for. Additional research is warranted to determine whether the TRA has better predictive utility for other behaviors with this population.

Hispanic ethnicity was significantly associated with intention. This is not surprising, because legumes are commonly consumed by members of this ethnic group. It is less clear why the

Table 2
Hierarchical Regression Analysis for the Prediction of Intention to Choose Legumes at School Lunch

Variables	Odds Ratio	95% Confidence Interval	P Value	Pseudo- <i>R</i> ²
Step 1				
Attitude	1.24	1.02–1.51	0.03	0.01
Subjective norm	1.11	0.96–1.29	0.15	
Step 2				
Attitude	1.21	0.99–1.47	0.06	0.06
Subjective norm	1.04	0.88–1.24	0.62	
Sex	1.38	0.80–2.37	0.24	
Black	2.07	0.83–5.18	0.12	
Hispanic	2.43	1.84–3.12	<0.01	
Asian	1.34	0.64–2.80	0.43	
Multiracial/other	4.18	2.25–7.76	<0.01	
Step 3				
Attitude	1.16	0.95–1.40	0.14	0.13
Subjective norm	1.02	0.84–1.24	0.84	
Sex	1.29	0.72–2.31	0.40	
Black	1.16	0.46–2.93	0.75	
Hispanic	1.40	0.99–1.99	0.06	
Asian	1.49	0.56–3.99	0.43	
Multiracial/other	2.86	1.40–5.85	<0.01	
Preference	1.47	1.36–1.59	<0.01	

multiracial/other ethnicity was also associated with intention.

Preference was significantly associated with intention to choose legumes, suggesting that hedonic factors, rather than reasoned judgments such as attitudes and subjective norms, may be more critical for influencing young elementary school children's intentions. It is unclear whether the model fails to predict intention because the constructs are unrelated to intentions among this population and behavior, or because children are not able to adequately interpret or address the cognitive aspects of the TRA questions. This warrants further investigation.

The pseudo-R² remained low even when sex, ethnicity, and preference were included in the model. More research is necessary to determine other factors that are predictive for this behavior.

Limitations

There are several limitations to this study. Survey data were collected from one community, and that may limit generalizability. However, the community was chosen to be representative of urban, multicultural communities. The participation rate for the survey was 36.7%. Compared to the total popula-

tion, a higher percentage of female children and a lower percentage of Hispanic children participated. However, the overall study to which children were recruited was not specifically related to legumes and participation was unlikely to be related to factors specific to this food that could have biased the results.

This study examined behavioral intention, which may not be related to actual behavior. Children had access to beans at school lunch, but they may have perceived other environmental barriers to choosing them. Ability to buy school lunch is one potential barrier. However, a high percentage (60.8%) of children in the school district were eligible for free or reduced lunch. Less than 7% of the sample indicated that they had never tried the school lunch.

This study is also limited in that only one question was used to assess most components of the TRA. The exception to this was that two questions were used to assess behavioral beliefs: one positive and one negative. It is possible that more questions were needed to adequately capture the theory's constructs. However, the number of questions was deliberately limited to avoid

taxing the cognitive abilities of the children. Furthermore, focus groups were used to help insure that the most salient beliefs would be included.

Many of the questions had low test-retest reliability. Although the lower values are consistent with what other investigators have observed with children in this age group,⁹ further studies would help determine whether the constructs are not stable or the questions were not phrased adequately to demonstrate stability over time.

Significance

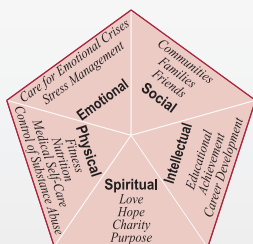
The results of this study suggest that the Theory of Reasoned Action is probably not an appropriate model to use to either predict dietary behaviors in young elementary school children or to help design interventions to change those behaviors.

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(O'Donnell, *American Journal of Health Promotion*, 1989, 3(3):5.)

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